

Notice of Allowability**Application No.**

10/589,962

Examiner

CHRISTINA RIDDLE

Applicant(s)

NAGASAKA, HIROYUKI

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to pre-appeal conf. decision 10/26/2011.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are 1,4-12,15-23,26,27,29,30 and 40-42.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some* c) ☐ None of the:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: ____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date ____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date ____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date ____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413),
Paper No./Mail Date 20111017-2.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other ____.

/C. R./
Examiner, Art Unit 2882

DETAILED ACTION

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Steve Jinks on 10/17/2011.

The application has been amended as follows:

Claim 1 (Currently Amended): An exposure method in which a plurality of times of exposure is performed on a same photosensitive object wherein

a substantial wavelength of an exposure light in a space between a projection optical system, which projects said exposure light on said photosensitive object, and said photosensitive object is different in at least one exposure in said plurality of times of exposure from another exposure in said plurality of times of exposure, and a wavelength of said exposure light that enters said space for said at least one exposure is the same as a wavelength of said exposure light that enters said space for said another exposure, and

each of a plurality of areas on said photosensitive object is exposed by said plurality of times of exposure, and after said plurality of areas are exposed by one of

said at least one exposure and said another exposure, said plurality of areas are exposed by the other of said at least one exposure and said another exposure,

wherein said exposure method is performed using a single exposure apparatus and said same photosensitive object is exposed with one illumination area, between said projection optical system and said photosensitive object, for said at least one exposure and said another exposure of said plurality of times of exposure,

wherein in said at least one exposure, said space is in a state filled with a predetermined liquid.

Claim 3 (Canceled).

Claim 4 (Currently Amended): The exposure method according to Claim [[3]] 1 wherein in said another exposure, said space is in a state filled with another liquid that has a refractive index smaller than a refractive index of said predetermined liquid.

Claim 5 (Currently Amended): The exposure method according to Claim [[3]] 1 wherein in said another exposure, said space is in a state filled with another liquid that has solubility to a specific material contained within a photosensitive agent of said photosensitive object lower than said predetermined liquid.

Claim 6 (Currently Amended): The exposure method according to Claim [[3]] 1 wherein in said another exposure, said space is in a state not filled with liquid.

Claim 12 (Currently Amended): An exposure method in which a plurality of times of exposure is performed on a same photosensitive object, said method comprising:

exposing, under a first exposure condition where a substantial wavelength of an exposure light in a space between an optical member and said photosensitive object is a first wavelength, said photosensitive object by said exposure light of said first wavelength; and

exposing, under a second exposure condition where a substantial wavelength of said exposure light in a space between said optical member and said photosensitive object is a second wavelength different from said first wavelength, said photosensitive object by said exposure light of said second wavelength, wherein

a wavelength of said exposure light that enters said space under said first exposure condition is the same as a wavelength of said exposure light that enters said space under said second exposure condition,

each of a plurality of areas on said photosensitive object is exposed by said plurality of times of exposure, and after said plurality of areas are exposed by one of the exposure under said first exposure condition and the exposure under said second exposure condition, said plurality of areas are exposed by the other of the exposure under said first exposure condition and the exposure under said second exposure condition, and

said exposure under said first exposure condition and said exposure under said second exposure condition are severally executed in a same exposure apparatus with one illumination area between said optical member and said photosensitive object,
wherein said exposure under said first exposure condition is an immersion exposure performed in a state where said space is filled with a predetermined liquid.

Claim 14 (Canceled).

Claim 15 (Currently Amended): The exposure method according to Claim [[14]] 12 wherein said exposure under said second exposure condition is an immersion exposure performed in a state where said space is filled with another liquid that has a refractive index different from a refractive index of said predetermined liquid.

Claim 17 (Currently Amended): The exposure method according to Claim [[14]] 12 wherein said exposure under said second exposure condition is an immersion exposure performed in a state where said space is filled with another liquid that has solubility to a specific material contained within a photosensitive agent of said photosensitive object different from said predetermined liquid.

Claim 19 (Currently Amended): The exposure method according to Claim [[14]] 12 wherein said exposure under said second exposure condition is a dry exposure performed in a state where said space is not filled with liquid.

Claim 27 (Currently Amended): An exposure apparatus that performs a plurality of times of exposure on a same photosensitive object, said apparatus comprising:

a stage that holds said photosensitive object;

a projection optical system that projects an exposure light on said photosensitive object;

an adjustment unit that adjusts a substantial wavelength of said exposure light in a space between said projection optical system and said photosensitive object; and

a control unit that controls said adjustment unit when exposing said photosensitive object a plurality of times so that in at least one exposure of said plurality of times, said substantial wavelength of said exposure light in said space is different from the substantial wavelength in another exposure,

wherein the exposure apparatus is a single exposure apparatus and said same photosensitive object is exposed with one illumination area, between said projection optical system and said same photosensitive object, for said at least one exposure and said another exposure, and

wherein a wavelength of said exposure light that enters said space is a same wavelength for said at least one exposure and for said another exposure, and said adjustment unit adjusts the substantial wavelength after the exposure light enters said space,

wherein said adjustment unit comprises a liquid supply mechanism that supplies a predetermined liquid so that in a space between said projection optical system and

said stage, at least a space between said projection optical system and said photosensitive object on said stage is filled with said liquid, whereby said control unit controls said adjustment unit so that said liquid supply mechanism supplies said liquid to said space between said projection optical system and said photosensitive object on said stage in said at least one exposure, whereas in said another exposure said liquid supply mechanism does not supply said liquid to said space.

Claim 28 (Canceled).

Allowable Subject Matter

2. Claims 1, 4-12, 15-23, 26, 27, 29, 30, and 40-42 are allowed.
3. The following is an examiner's statement of reasons for allowance.

Regarding claims 1, 12, and 27, the prior art of record, either alone or in combination, fails to teach or render obvious an exposure method and apparatus wherein a substantial wavelength of an exposure light in a space between a projection optical system, which projects said exposure light on said photosensitive object, and said photosensitive object is different in at least one exposure in said plurality of times of exposure from another exposure in said plurality of times of exposure, and a wavelength of said exposure light that enters said space for said at least one exposure is the same as a wavelength of said exposure light that enters said space for said another exposure, wherein said exposure method is performed using a single exposure

apparatus and said same photosensitive object is exposed with one illumination area, between said projection optical system and said photosensitive object, for said at least one exposure and said another exposure of said plurality of times of exposure, wherein in said at least one exposure, said space is in a state filled with a predetermined liquid. This limitation in combination with the other limitations of claims 1, 12, and 27 render the claims non-obvious over the prior art of record.

The dependent claims are likewise allowable by virtue of their dependency upon an allowable independent claim as stated above.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTINA RIDDLE whose telephone number is (571)270-7538. The examiner can normally be reached on Monday- Thursday 6:00-4:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Glick can be reached on (571)272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/C. R./
Examiner, Art Unit 2882

/Edward J Glick/
Supervisory Patent Examiner, Art Unit 2882